400 Watt DC to AC Power Inverter

Converts 12V DC Battery Power into 110-120V AC Home Power

OWNER'S MANUAL

– SAVE THESE INSTRUCTIONS –

Use Schumacher inverters to convert low-voltage, direct-current (DC) to 110-volt alternating household current (AC). Two sources of power are:

- Standard 12-volt automobile and marine batteries
- Portable high-power, 12-volt sources like those found in jump starter and DC power sources.

MODEL PI-400 00-99-000346/0308

The advanced surge capacity of the PI-400 power inverter gives it the means to start most electrical appliances including: Color televisions, TV/VCR combinations, microwaves, refrigeration units, small air conditioners.

In addition, the PI-400 power inverter consumes less battery power, therefore runs for a longer time because it is a state-of-the-art inverter. It runs cooler and is highly efficient.

Before Using PI-400

When you turn on an appliance or a tool that runs on a motor, the appliance basically goes through two stages:

1. Start up - requiring an initial surge of power (commonly known as the "starting load" or "peakload").
2. Continuous operation - power consumption drops (commonly known as the "continuous load").

Before using your power inverter, you need to calculate these loads, i.e.:

1. Starting load (at start up).

2. Continuous load (on continuous operation).

The formula for power consumption (measured in either WATTS (wattage) or AMPS (amperes) is: AMPS x 110 (AC voltage) = WATTS. The wattage (WATTS) or amperes (AMPS) can normally be found stamped or printed on most appliances and equipment, or in the user's manual. Otherwise, contact the manufacturer to find out whether the device you are using is compatible with a modified sine wave.

To calculate the starting load: Starting Load = 2 x WATTS. In general, the start up load of the appliance or power tool determines whether your inverter has the capability to power it.

To calculate the continuous load (same as wattage in the above formula): Continuous load = AMPS x 110 (AC voltage)

Attention: Always run a test to establish whether the inverter will operate a particular piece of equipment or appliance.

In the event of a power overload, the inverter is designed to automatically shut down. This safety feature prevents damaging the inverter while testing appliances and equipment within the 400-watt range.

If an appliance will not operate properly when first connected to the inverter, turn the inverter rocker switch ON (I), OFF (0), and ON (I) again in quick succession. If this procedure is not successful, it is likely that the PI-400 inverter does not have the required capacity to operate the appliance in question.

Important: Make sure you connect your inverter to a 12-volt power supply only.

- Do not attempt to connect the inverter to any other power source, including any AC power source.
- Do not try extending or otherwise changing the 12-volt power cord attached to your inverter.

- Incorrect operation of your inverter may result in damage and personal injury. Electrical current on a 110-volt circuit can be very dangerous.

Your inverter features include:

A. ON/OFF Rocker Switch
B. LED Indicator Light. (Green = Power ON, Red = Overload)
C. Two Standard Electrical 110V AC Outlets
D. 12-Volt Power Cord
E. High-Speed Cooling Fan
F. (2) 25-Amp Fuses

How To Connect your PI-400 Inverter

Make sure the ON/OFF rocker switch is in the OFF (0) position. (If connecting in a vehicle, remove the cigarette lighter from its outlet.) Push the 12-volt power plug firmly into the outlet. Switch the inverter rocker switch to the ON (I) position. The LED indicator light should glow GREEN verifying the inverter is receiving power. Turn the inverter rocker switch to the OFF (0) position. (The GREEN LED power indicator light may flash briefly and/or the internal speaker may make a brief "beep." This is normal). Make sure that the appliance to be operated is turned OFF. Plug the appliance into one of the two AC outlets. Turn the inverter rocker switch to the ON (I) position. Turn the appliance on.

Attention: The internal speaker may also make a brief "beep" when the inverter is being connected to or disconnected from the 12-volt power source.

You can use an extension cord from the inverter to the appliance without significantly decreasing the power being generated by the inverter. For best operating results, the extension cord should be no longer than 50 feet.

The LED Indicator briefly flashing when you first turn the inverter ON, is a sign if that there is a short circuit within the power supply. Turn the inverter OFF. Remove the 12-volt plug from the cigarette lighter socket. Firmly re-insert the plug. Turn the inverter ON again. If this does not remedy the problem try using a different 12-volt power source.

Using the Inverter to Operate a TV or Audio Appliance
The inverter is shielded and filtered to minimize signal interference. Despite this, some interference may occur with your television picture, especially with weak signals. Below are some suggestions to try and improve reception.

Make sure the television antenna produces a clear signal under normal operating conditions (i.e., at home plugged into a standard 110 AC wall outlet). Also, ensure that the antenna cable is adequately shielded and of good quality. Try altering the positions of the inverter, antenna cables, and television power cord. Add an extension cord from the inverter to the TV so as to isolate its power cord and antenna cables from the 12-volt power source. Try coiling the television power cord and the input cables running from the 12-volt power source to the inverter. Affix one or several "Ferrite Data Line Filters" to the television power cord. Ferrite Data Line Filters can be purchased at most electronic supply stores including Radio Shack - Part

Number 273-105. Try grounding the inverter with an 18 AWG (minimum) wire, using as short a length as possible.

Attention: You may hear a "buzzing" sound being emitted from inexpensive sound systems when operated with the inverter. This is due to ineffective filters in the sound system. Unfortunately, this problem can only be resolved by purchasing a sound system with a higher quality power supply.

If the Inverter Fuse Blows?
Your PI-400 power inverter is fitted with 25-amp spade type fuses, which should not have to be replaced under normal operating circumstances. A blown fuse is usually caused by reverse polarity or a short circuit within the appliance or equipment being operated.

If the fuse does blow:

1. Disconnect the appliance or equipment immediately.
2. Find the source of the problem, and repair it.
3. Install the new fuse (supplied with your power inverter.)

Attention: Do not install a fuse higher than 25-amps, as this may damage the inverter. Make sure to correct the cause of the blown fuse before using the PI-400 again.

Power Source
Your average automobile or marine battery will provide an ample power supply to the inverter for 30 to 45 minutes even when the engine is off. The actual length of time the inverter will function depends on:

1. Age and condition of the battery.
2. Power demand being placed by the equipment being operated with the inverter.

If you decide to use the inverter while the engine is off, we recommend: Turn OFF the device plugged into the inverter before starting the engine. Start the engine every hour and let it run for approximately 10 minutes to recharge the battery.

Attention: Although it is not necessary to disconnect the inverter when turning over the engine, it may briefly cease to operate as the battery voltage decreases. When the inverter is not supplying power, it draws a very low amperage from the battery. The inverter may be left connected to the battery for up to three hours. It is recommended that the inverter always be disconnected when not in use.

Safety Features
The LED Indicator light will turn from GREEN to RED and the inverter will automatically turn itself off when:

1. The power input from the battery drops to approximately 10 volts. (When the power input drops to approximately 10.5 volts, an alarm will sound for an extended period).
2. The power input from the battery exceeds 15 volts.

3. The continuous load demand from the equipment or appliance being operated exceeds 400 watts.
4. The circuit temperature exceeds 145 ºF.

Attention: The PI-400 is fitted with a cooling fan that runs as needed while the inverter is operating. If the cooling fan is unable to maintain a cool enough temperature for safe operation, the inverter will automatically shut down. If the inverter automatically shuts down or a continuous audible alarm is heard:

1. Turn the inverter rocker switch to the OFF (0).
2. Determine the source of the problem, and resolve it before continuing to use the inverter.

Important Safety Measures

- For the most effective use, place the power inverter on a flat surface.
- Keep the inverter dry.
- DO NOT allow it to come into contact with rain or moisture.
- DO NOT operate the inverter if you, the inverter, the device being operated or any other surfaces that may come in contact with any power source are wet. Water and many other liquids can conduct electricity, which may lead to serious injury or death.
- Do not place the inverter on or near heating vents, radiators or other sources of heat.
- Do not place the inverter in direct sunlight. The ideal air temperature for operation is between 50º and 80ºF.

- Keep the inverter well ventilated in order to properly disperse heat generated while it is in use.
- While in use, make sure there are several inches of clearance around the top and sides of the inverter.
- Do not use the inverter near inflammable materials.
- Do not place the inverter in areas such as battery compartments where fumes or gases may accumulate.

How Do Power Inverters Work?
There are two stages involved in transforming 12-volt DC (or battery) power into 110V AC (household voltage):

STAGE 1: The PI-400 power inverter uses a DC to DC transformer to increase the 12-volt DC input voltage from the power source to 145-volts DC.

STAGE 2: The inverter then converts the 145-volts DC into 110-volts AC (household voltage) using advanced MOSFET transistors in a full bridge configuration. A "modified sine wave" waveform is generated by this conversion.

For Your Safety: Precautions to keep in mind before and while using your power inverter:

- Only connect the power inverter to a 12-volt battery.
- Only connect the power inverter to a 12-volt battery with the supplied 12- volt power cords. Make sure the cord connections to the inverter are tight.
- Do not modify the power cord or plug in any way.

- Make sure the inverter is not close to any potential source of inflammable fumes or gases before connecting the inverter to the power source.
- Make sure the power consumption of the appliance or equipment you want to operate is compatible with the capacity of the inverter, i.e. does not exceed 400 watts.
- If you are using the power inverter to operate battery charger, monitor the temperature of the battery charger for about 10 minutes. If the battery charger becomes abnormally warm, disconnect it from the inverter immediately.
- Use only 25-amp spade type fuses.
- If you are powering the inverter with an automobile or marine battery, start the engine every 30 to 45 minutes and let it run for about 10 minutes to recharge the battery.
- If you hear a continuous alarm or automatic shut down, turn the inverter OFF immediately. Do not restart the inverter until the source of the problem has been identified and corrected.
- Disconnect the inverter when not in use, in order to avoid battery drain.

Troubleshooting

PROBLEM: Low or No Output Voltage
Reason*/Solution*

1. **Poor contact at terminals.**
   Unhook and re-hook the 12-volt connections.

2. **Using incorrect type of voltmeter to test output voltage.**
   Use a true RMS reading meter.

PROBLEM: Red LED On
Reason*/Solution*

1. **Battery voltage below 11 volts.**
   Recharge or replace battery.

2. **Equipment being operated is drawing too much power.**
   Use a higher capacity inverter or do not use this equipment.

3. **Inverter is too hot (thermal shut down mode).**
   Allow inverter to cool. Check for adequate ventilation. Reduce the load on the inverter to rated continuous power output.

4. **Unit may be defective.**
   See warranty and call customer service.

PROBLEM: Low Battery Alarm On All The Time
Reason*/Solution*

1. **Input voltage below 11 volts.**
   Recharge or replace battery to maintain adequate power input.

2. **Poor or weak battery condition.**
   Recharge or replace battery.

3. **Inadequate power being delivered to the inverter or excessive voltage drop.**
   Check condition of cigarette lighter socket. Clean or replace if necessary.

PROBLEM: TV Does Not Work
Reason*/Solution*

1. **TV does not turn on.**
   Try turning the inverter ON, then OFF, then ON again. Contact TV manufacture for start up surge and/or if the TV is compatible with a modified sine wave. An inverter producing a larger power out put may be required.

SPECIFICATIONS:

Maximum Continuous Power ..... 400 Watts

Surge Capability (Peak Power) ..... 800 Watts

No Load Current Draw ..... < 0.4A

Wave form ..... Modified Sine Wave

Input Voltage Range..... 10-15 VDC

AC outlets.....110V AC 3-prong grounded

Fuse..... (2), 25-amp (spade type)

Dimensions ..... 6.5” L x 4.13" W x 2.2" H

Weight ..... approx. 2.0 lbs.

Limited Warranty

Schumacher Electric Corporation warrants your inverter to be free from defects in material and workmanship, excepting abuse or misuse, for a period of two years from the date of sale to the original user or consumer purchaser. If your inverter malfunctions or fails within the 24-month warranty period because of a defect in material or workmanship, we will repair it without charge or replace it.

This warranty is in lieu of all other express warranties. The duration of any implied warranty, including but not limited to, any implied warranty of merchantability or fitness for a particular purpose made in respect to your unit, is limited to the period of the express warranty set forth above.

For warranty service, return your inverter, **as well as proof of purchase** to the factory or a designated agent:

Schumacher Electric Corporation
Warranty Service Department
1025 Thompson, Hoopeston, IL 60942
Phone: 800-621-5485
(Hours: 7 a.m. - 4:30 p.m. CST)

You will be responsible for all insurance and freight or other transportation charges to the factory or point of repair. We will return your inverter freight prepaid if repair is covered under warranty. Your inverter should be properly packed to avoid damage in transit since we will not be responsible for any such damage.

In no event shall Schumacher Electric Corporation be liable for consequential damages. Some states do not allow limitations on the length of the implied warranty or the exclusion or limitations of incidental or consequential damages, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights and you may also have other rights which may vary from state to state.

Schumacher Website: www.batterychargers.com